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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,915	11/26/2003	Masaru Sawada	0941.68762	1898

7590 02/09/2007
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EXAMINER

GHULAMALI, QUTBUDDIN

ART UNIT	PAPER NUMBER
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2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/722,915	SAWADA ET AL.	
	Examiner	Art Unit	
	Qutub Ghulamali	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3/29/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1-5, 10 and 11 are objected to because of the following informalities:

Claim 1 recites in line 18 "conditional". Shouldn't it recite "conditioning"?

Appropriate correction is required.

Claim 1, line 19, "multiplication coefficients" should be amended to read "multiplication coefficient". Claim 1, line 19, after "multiplication coefficient for the", -- FIR -- should be inserted.

Claim 2, line 20, "multiplication coefficients" should be amended to read "multiplication coefficient".

Claim 1, line 20, after "multiplication coefficient for the", -- FIR -- should be inserted.

Claim 3, line 12, after "a predetermined restricting conditional vector," "a" should be replaced with -- the --.

Claim 3, line 24, "multiplication coefficients" should be amended to read "multiplication coefficient".

Claim 4, line 22, "multiplication coefficients" should be amended to read "multiplication coefficient".

Claim 5, line 23, "multiplication coefficients" should be amended to read "multiplication coefficient".

Claims 10 and 14, line 3, "said fir" should be amended to read "said first".

Claim 11, line 4, "multiplication coefficients" should be amended to read "multiplication coefficient".

2. Claim 8 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim *should refer to other claims in the alternative only*. See MPEP § 608.01(n). Accordingly, the claim 8 has not been further treated on the merits.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 1-7, 9, 11, 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 2, 3, 4, 5 and 6, recite the limitation "the FIR filter" in lines 8, 9, 9, 12, 12 and 12, respectively. There is insufficient antecedent basis for this limitation in the claims.

Claims 2 and 3, recite the limitation "the same condition" in the last line and line 20 respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim 3, recites the limitation "the output" in the line 14. There is insufficient antecedent basis for this limitation in the claim.

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Claim 7, recites the limitation "the higher order side" and "the lowest order" in lines 5 and 6 respectively. There is insufficient antecedent basis for these limitations in the claim.

Claim 7, recites the limitation "the current coefficient" in lines 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 9, recites the limitation "the higher order side" and "the lowest order" in lines 5 and 8 respectively. There is insufficient antecedent basis for these limitations in the claim.

Claim 11, recites the limitation "the higher order side" and "the lowest order" in lines 5 and 8 respectively. There is insufficient antecedent basis for these limitations in the claim.

Claim 13, recites the limitation "the higher order side" and "the lowest order" in lines 5 and 11 respectively. There is insufficient antecedent basis for these limitations in the claim.

Claim 13, recites the limitation "the highest order coefficient" in the last line. There is insufficient antecedent basis for this limitation in the claim.

Allowable Subject Matter

5. Claims 1-7, 9 11-14 would be allowable if rewritten or amended to overcome:

1) the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action, and

2) the claim objections set forth in this Office action.

Reason For Allowance

6. The following is an examiner's statement of reasons for allowance: The prior art of record in combination with other claimed limitations neither teaches nor renders obvious a method of training equalizer comprising:

a) utilizing, as a restricted coefficient updating vector applied for updating the multiplication coefficient for each tap of the FIR filter, a vector obtained from projecting, onto a plane perpendicular to a predetermined restricting conditioning vector, a coefficient updating vector determined based on an equalizer error between the output of the FIR equalizer and a reproduction output determined therefrom, and a delayed input value for each tap of the FIR equalizer; and

b) utilizing, as the predetermined restricting conditional vector, a coefficient vector comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error, as recited in claims 1, 4 and 5.

b) utilizing, as the predetermined restricting conditional vector, a vector which is a difference between a coefficient vector comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error and another coefficient vector immediately subsequent thereto obtained in the same condition as recited in claim 2.

b) utilizing, as the predetermined restricting conditional vector, a vector which is a difference between a subsequent coefficient vector obtained in the same condition immediately subsequent to and an antecedent coefficient vector obtained in the same condition immediately antecedent to a reference coefficient comprising the multiplication

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coefficients for the equalizer obtained upon calculating the equalizer error as recited in claim 3.

Claim 6, in combination with other claimed limitations, said training part utilizes, as the restricting conditional vector, a vector which is a difference between a subsequent coefficient vector obtained in the same condition immediately subsequent to and an antecedent coefficient vector obtained in the same condition immediately antecedent to a reference coefficient comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error.

Such limitations as recited in these claims is neither anticipated nor rendered obvious by prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patents:

US Pub. (2004/0028159) to Abdelilah et al.

US Pub. (2004/0047409) to Lee et al.

US Pub. (2004/0071206) to Takatsu.

US Pub. (2005/0169361) to Yousef et al.

US Pub. (2004/0233981) to Porter et al.

US Pub. (2004/0091037) to Balasubramonian et al.

US Patent (5,999,355) to Behrens et al.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.

January 23, 2007.


MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER